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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,345	12/30/2003	Wenqing Jiang	(P3154US1) 18602-08541	7604
61520 7590 05/17/2007 APPLE/FENWICK SILICON VALLEY CENTER 801 CALIFORNIA STREET MOUNTAIN VIEW, CA 94041			EXAMINER SENF1, BEHROOZ M	
			ART UNIT 2621	PAPER NUMBER
			MAIL DATE 05/17/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/751,345	Applicant(s) JIANG ET AL.	
	Examiner Behrooz Senfi	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 13-32 is/are rejected.
- 7) ☒ Claim(s) 10-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 – 3, 13 – 14 and 18 - 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Lu et al (US 2005/0058200).

Regarding claim 1, Lu '200 discloses, a method for robust multi-pass variable bit rate video encoding (fig. 2), the method comprising; an encoding manager performing a first-pass encoding of a video sequence (i.e. fig. 3, first-pass encoder 1); the encoding manager collecting data concerning the video sequence during the first-pass encoding (i.e. figs. 2 – 3, information collector 230, 340); the encoding manager utilizing collected data to construct a data analysis model concerning the video sequence (i.e. figs. 2 – 3, information collector processor 230 and 340), the data analysis model comprising at least a frame model concerning each frame of the video sequence (i.e. page 2, paragraph 0023, I, P and B), and a sequence model concerning the video sequence as a whole (page 3, right column, lines 1 – 3); the encoding manager utilizing the data analysis model to generate a rate profile for the video sequence, the rate profile complying with a bit budget for the video sequence (i.e. page 2, paragraph 0021),

avoiding buffer underflow for each frame of the video sequence (i.e. page 2, paragraph 0025), distinguishing between easy and hard segments of the video sequence and allocating bits to segments as a function of segment complexity (consider as, picture/frame complexity, page 2, paragraphs 0021 – 0023), and the encoding manager utilizing the rate profile to perform a second-pass encoding of the video sequence (i.e. fig. 3, second encoder/ second pass encoder 320).

Regarding claim 2, Lu '200 discloses, wherein the encoding manager performing the first-pass encoding of the video sequence comprises; the encoding manager performing a step from a group of steps consisting of; encoding the video sequence with a constant Q, without rate control; encoding the video sequence utilizing one pass variable bit rate encoding, thereby attempting to achieve a target bit rate; and encoding the video sequence utilizing one pass constant bit rate encoding (i.e. fig. 3).

Regarding claim 3, Lu '200 discloses, wherein the encoding manager collecting data concerning the video sequence during the first-pass encoding further comprises; the encoding manager collecting data to be used to construct a data analysis model concerning the video sequence, the collected data comprising at least one data point concerning each frame of the sequence from a list of data points consisting of: a picture type; a bit total; a DCT bit total; an average mquant; an average activity; a scene change indicator; a fade indicator; a still frame indicator; and a transition indicator (i.e. page 2, paragraph 0023, picture type I, P and/or B picture).

Regarding claims 13 - 14, the limitations, whether a bit rate for a frame encoded according to the calculated Q is within a margin of error of a bit rate calculated for that

frame by the encoding manager during rate profile generation, reads on (VBV buffer control to prevent buffer underflow and overflow, page 2, paragraphs 0026 – 0027).

Regarding claim 18, the limitations, the encoding manager determining whether the encoding of the frame causes underflow; and responsive to determining that the encoding of the frame causes underflow, the encoding manager adjusting the bit rate of the frame so as to eliminate the underflow (page 2, paragraph 0026).

Regarding claims 19 - 21, the limitations, for each frame of the video sequence, the encoding manager performing the following steps: refining at least one model parameter concerning that frame from a group of model parameters consisting of: bit rate; and complexity; updating the model for that frame based on at least one refined model parameter; calculating an optimized Q for that frame based on the updated model; and encoding the frame according to the optimized Q (page 2, paragraph 0021 – 0024).

Regarding claims 22 - 23, the limitations, until a condition occurs from a group of conditions consisting of: the encoding manager determining that encoding a frame according to an optimized Q does not result in buffer underflow; and the encoding manager encoding the frame according to an optimized Q a maximum number of times; and the encoding manager accepting the last encoding of the frame as the encoding for that frame, reads on (Lu; determining the coding strategy for video frames, pages 2 – 3, paragraphs 0021 – 0028).

Regarding claims 24 and 27, the limitations claimed are substantially similar to claim 1 above, and are the system claim of the method claim 1; which have been analyzed and rejected with respect to claim 1 above.

Regarding claims 25 and 28, the limitations claimed, have been analyzed and rejected with respect to claim 13 above.

Regarding claims 26 and 29, the limitations claimed, have been analyzed and rejected with respect to claim 19 above.

Regarding claim 30, the limitations claimed are substantially similar to claim 1 and are computer program code to carry on the process; since the disclosure of Lu is computer implemented (i.e. page 4, 22), therefore the ground for rejecting claim 1 also applies here.

Regarding claims 31 – 32, the limitations claimed, have been analyzed and rejected with respect to claims 13 and 19 above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 – 9 and 15 - 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al (US 2005/0058200) in view of Blawat et al (US 6,198,878).

Regarding claim 4, Lu '200 (i.e. page 2, paragraphs 0021 – 0022) teaches, frame bit-rate, frame complexity and quantization.

Lu is silent in regards to explicit of overhead bit.

Blawat (i.e. col. 3, lines 35 – 41) teaches the above subject matter, bit needed to encode overhead information.

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the video coding system of Lu in accordance with the teaching of Blawat to improve coding quality.

Regarding claim 5, the limitations, encoding manager utilizing collected data to calculate complexity and bit overhead for each frame of the video sequence, have been covered with respect to claim 4 above.

Regarding claim 6, the limitation, the sequence model identifying transitions in the video sequence, reads on (Blawat; col. 3, lines 5 – 10).

Regarding claim 7, the limitations claimed are substantially similar to claim 4 above; therefore the ground for rejecting claim 4 also applies here.

Regarding claim 8, the limitations, the encoding manager calculating an initial bit rate profile for the video sequence by, for each frame of the video sequence, calculating a bit rate for that frame as a function of the calculated initial Q, the complexity of the frame and the bit overhead of the frame (Lu, page 2, paragraph, 0021 and also Blawat; col. 3, lines 2 – 40).

Regarding claim 9, the limitations, adjusting the calculated bit rate for at least one frame based on at least one factor from a group of factors consisting of: the calculated

bit rate being less than a minimum number of bits for a frame; the calculated bit rate being at least as few bits as the bit overhead for the frame; and the frame being a transition frame in the video sequence (Lu; page 3, paragraph 0027).

Regarding claims 15 - 17, the limitations, a mathematical relationship between complexity, bit overhead, and updated bit rate, and an updated Q and for that macro-block; encoding each macro-block according to its corresponding macro-block model; and collecting modeling data concerning each macro-block during the encoding thereof (Blawat; col.2, lines 40 – 55 and col. 3, lines 1 – 60).

Allowable Subject Matter

5. Claims 10 – 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is an examiner's statement of reasons for allowance: the prior art of the record fails to anticipate or rendered obvious the limitation, the encoding manager simulating decoding of at least a portion of the video sequence according to an initial rate profile; the encoding manager determining whether any flames underflow the buffer; the encoding manager determining whether any flames overflow the buffer; responsive to a segment of the video sequence transitioning the buffer from overflow to underflow, the encoding manager classifying that segment as hard; the encoding manager calculating an updated Q for each hard segment, so as to avoid the underflow of that hard segment; and the encoding manager calculating an updated Q for the video sequence absent any hard segments, based on the number of bits added to the bit

budget as a result of calculating an updated Q for each hard segment; and the encoding manager reformulating the initial rate profile based on the updated Qs for each hard segment and the updated Q for the video sequence absent any hard segments, in claim 10.

Claims 11 - 12 consider allowable based on dependency to allowable claim 10.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Behrooz Senfi** whose telephone number is **(571) 272-7339**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mehrdad Dastouri** can be reached on **(571) 272-7418**.

Hand-delivered responses should be brought to Randolph Building, 401 Dulany Street, Alexandria, Va. 22314.

Any inquiry of a general nature or relative to the status of the application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is **(571) 272-6000**,

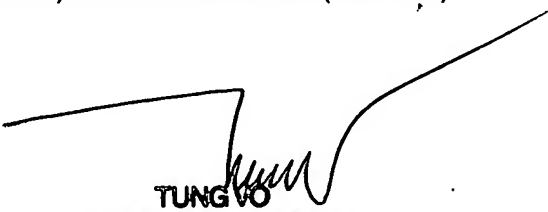
Or faxed to:

(571) 273-8300

Art Unit: 2621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

B.M.S.



TUNG VO
PRIMARY EXAMINER